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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,382	01/23/2001	Hiroyuki Kado	NAK1-bn67	5335

7590

03/05/2003

Joseph W Price
Price Gess & ubell
2100 S E Main Street Suite 250
Irvine, CA 92614

EXAMINER

DONG, DALEI

ART UNIT	PAPER NUMBER
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2875

DATE MAILED: 03/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,382

Applicant(s)

KADO ET AL.

Examiner

Dalei Dong

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-- **Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --**
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/744,382.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the depression is provided is wider than other parts of the sealant layer must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. Figure 16 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

On page 23, line 8 "heating furnace 51" should be heating furnace 41.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 8 and 19-26 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the claim 8 is incomplete.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 27 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,236,159 to Inoue.

Regarding to claim 27, Betsui discloses in Figure 3, an apparatus for sealing a front panel and a back panel that have been placed facing each other with a sealant layer between outer regions of the panels and a gas circulating unit.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,846,110 to Kanagu in view of U.S. Patent No. 6,109,994 to Cho.

Regarding to claims 1-11, Kanagu discloses in Figures 5 and 6, a method of manufacturing a plasma display panel comprising “a front panel 10, shown in Figure 6, supported by a glass substrate 11 as a support body is first made in a front panel process P10 (FIG. 5), and a back panel 20 supported by a glass substrate 21 as a support body is manufactured concurrently in a back panel process P20 (FIG. 5)” (column 8, line 4-9).

Kanagu also discloses in Figures 5 and 6, “next, in a sealing process P30 (FIG. 5) the pair of front panel 10 and back panel 10 is arranged to oppose each other (P31), so that the panel envelope is formed in a sealing process P32 as described below, at which the peripheral (frame) area of both the panels are sealed with each other” (column 8, line 10-14).

Kanagu further discloses in Figures 5 and 6, the “PDP 1 is completed after sequential passing an exhaust process (P41) at which an internal impurity gas is exhausted with a vacuum pump, and a process P42 at which a discharge gas, a mixture of

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neon, and a small amount of xenon is filled therein. Pressure of the discharge gas is about 500 Torr” (column 8, line 15-19).

Kanagu further yet discloses in Figures 5 and 6, “on completion of filling the discharge gas, discharge spaces 30 are completely sealed up by tipping off exhaust tube 60; as well as PDP 1 is separated from the external piping system” (column 8, line 20-24).

However, Kanagu does not disclose the shape of the sealant layer is set so as to provide at least one gap between the peripheral regions of the front panel and the back panel when the front panel and the back panel are placed facing each other. Cho teaches in Figures 6 and 7, “venting slots can be provided along edge sealing area 44s of outer wall 44 to facilitate removal of contaminant gases during the hermetic sealing operation performed in a vacuum chamber 54 or 74 in any of the processes of Figures 2, 4 and 5. Figure 6 illustrates how a cross section of composite structure 42/44/46 appears when venting slots 90 are provided along wall-edge sealing area 44s. Figure 7 presents a perspective view of structure 42/44/46 with venting slot 90” (column 24, line 5-12).

Cho also teaches “in the example of FIGS. 6 and 7, one venting slot 90 is provided in each of the four sub-walls that form outer wall 44. Each venting slot 90 in the illustrated example typically extends for at least 50% of the length of the sub-wall in which that slot 90 is formed. Other arrangements of venting slots 90 can be employed. For example, two or more of slots 90 can be created in one or more of the sub-walls of outer wall 44” (column 24, line 13-20)

Cho further teaches in Figures 6 and 7, "venting slots 90 can be formed by physically removing portions of outer wall 44 at the slot locations. When the sub-walls of wall 44 are created by firing frit that is in a "green" plastic (soft) state due to the presence of binding material in the frit, slots 90 are preferably formed in the sub-walls by appropriately pressing down on the green frit at the locations for vents 90 until they are formed after which the so-slotted frit is fired. Alternatively, when the sub-walls of wall 44 are in a hard (e.g., fired) state, slots 90 can be created by heating the sub-walls to a temperature sufficient to soften them and then appropriately pressing down on the sub-walls at the location for vents 90" (column 24, line 21-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have apply the venting slots of Cho to the sealant layer of plasma display panel of Kanagu in order to facilitate removal of contaminant gases during the hermetic sealing portion and thus increase the luminous intensity and prolong the lifetime of the plasma display panel.

Regarding to claim 12, Kanague discloses in Figure 5, "baking of the sealant material to de-gas therefrom in process P26 greatly decreases the impurities, such as organic solvents, which may emanate in the following sealing process P30 causing pollution of discharge space 30" (column 8, line 49-52). Kanague discloses the claimed invention except for the temperature range of 250°C to the softening point of the sealant layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the temperature range between 250°C to the softening point

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of the sealant layer, since it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding to claims 13-17, Kanagu discloses a method of manufacturing a plasma display panel comprising forming a phosphor layer on at least one of a main surface of a front panel facing a back panel and a main surface of the back panel facing the front panel and forming a sealant layer on a peripheral region of the main surface of the front panel facing the back panel.

However, Kanagu does not disclose the shape of the sealant layer is set so as to provide at least one gap between the peripheral regions of the front panel and the back panel and the sealing step is performed in a non-vacuum atmosphere. Cho teaches the shape of the sealant layer is set as to provide at least one gap between the peripheral regions of the front panel and the back panel and "using a suitable alignment system (not shown), structures 40 and 42/44/46 are positioned relative to each other in the manner shown in FIG. 2b. This entails aligning sealing areas 40S and 44S (vertically in FIG. 2b) and bringing the interior surface of baseplate structure 40 into contact with the remote (upper in FIG. 2b) edges of spacer walls 46. The alignment is done optically in a non-vacuum environment, normally at room pressure, with alignment marks provided on plate structures 40 and 42. Specifically, baseplate structure 40 is optically aligned to faceplate structure 42, thereby causing baseplate sealing area 40S to be aligned to upper wall edge 44S" (column 10, line 40-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have apply the venting sealant layer of Cho for the plasma display panel of Kanagu and further seal the plasma display panel of Kanagu in a non-vacuum environment of Cho in order to facilitate removal of contaminant gases and readily and effectively hermetic sealing the panels and thus increase the luminous intensity and prolong the lifetime of the plasma display panel and reduce the manufacturing cost.

10. Claims 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,846,110 to Kanagu in view of U.S. Patent No. 6,109,994 to Cho in further view of U.S. Patent No. 5,951,350 to Aoki.

Regarding to claims 18-26, Kanagu discloses a method of manufacturing a plasma display panel comprising forming a phosphor layer on at least one of a main surface of a front panel facing a back panel and a main surface of the back panel facing the front panel and forming a sealant layer on a peripheral region of the main surface of the front panel facing the back panel.

However, Kanagu does not disclose the shape of the sealant layer is set so as to provide at least one gap between the peripheral regions of the front panel and the back panel and the sealing step is performed in a non-vacuum atmosphere and a blue phosphor. Cho teaches the shape of the sealant layer is set as to provide at least one gap between the peripheral regions of the front panel and the back panel and sealing process of the front and back panel takes place in a non-vacuum environment.

However, Cho does not teach a blue phosphor. Aoki teaches “fluorescent substances generally used in PDPs can be used as the fluorescent substance grains contained in the fluorescent substance ink. The following are examples of such fluorescent substances:

blue fluorescent substance $\text{BaMgAl.sub.10 O.sub.17} : \text{Eu.sup.2+}$

green fluorescent substance $\text{BaAl.sub.12 O.sub.19} : \text{Mn}$ or $\text{Zn.sub.2 SiO.sub.4} : \text{Mn}$

red fluorescent substance $(\text{Y.sub.x Gd.sub.1-x})\text{BO.sub.3} : \text{Eu.sup.3+}$ or $\text{YBO.sub.3} :$

Eu.sup.3+ ” (column 7, line 4-14). Aoki teaches the same blue phosphor layer

composition as the specified in the limitation, therefore it would be inherent for the same blue phosphor layer to exhibit the same intrinsic characteristics and properties as detailed in the limitations.

Aoki also teaches in Figure 3, an driving circuit for driving the electrodes of the plasma display panel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have apply the venting sealant layer of Cho and the blue phosphor layer of Aoki for the plasma display panel of Kanagu and further seal the plasma display panel of Kanagu in a non-vacuum environment of Cho in order to facilitate removal of contaminant gases and readily and effectively hermetic sealing the panels and thus ease the manufacturing process and increase the luminous intensity and prolong the lifetime of the plasma display panel and reduce the manufacturing cost.

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Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of the method of manufacturing a plasma display panel.

U.S. Patent No. 5,754,003 to Murai.

U.S. Patent No. 6,030,267 to Browning.

U.S. Patent No. 6,129,603 to Sun.

U.S. Patent No. 6,236,159 to Inoue.

U.S. Patent No. 6,353,288 to Asano.

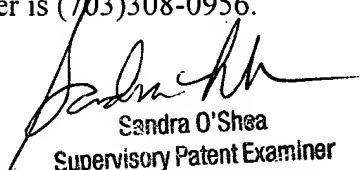
U.S. Patent No. 6,439,943 to Aoki.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
February 26, 2003


Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800